

REMARKS

Reconsideration and allowance of this application are respectfully requested in light of the above amendments and the following remarks.

The above amendments clarify the claimed subject matter to overcome the 35 USC 112, second paragraph, rejection and also emphasize patentable aspects of this invention. In particular, the claims are now limited to uplink transmissions in a UMTS system. The expression "transmit format combination subset" is in fact a technical term having a known meaning to those skilled in the technical field of a UMTS communication system. Furthermore, in view of the limitation of the claimed subject matter to uplink transmissions, the terms "receiving entity" and "transmitting entity" have been replaced by "mobile terminal" and "base station" respectively so as to obtain a consistent terminology throughout the claims. To overcome the objections regarding the term "a maximum resource of the transmitting device," the claims have been clarified to indicate that the transmission of the common control message is part of the scheduling operation. This amendment clarifies the interrelation between the scheduling step and the transmission step of the common control message.

In view of the above, the Applicants respectfully request reconsideration and withdrawal of the rejections under 35 USC 112, second paragraph.

Turning now to the prior art rejections, claims 32-39 were rejected under 35 USC 102(e) as anticipated by Hwang et al. (US 2002/0168945). Claims 24-31 and 40 were rejected under 35 USC 103(a) as unpatentable over Hwang et al. (US 2002/0168945) in view of Padovani et al. (USPN 7,079,550). To the extent that these rejections may be applied against the amended claims presented herein, the Applicants respectfully traverse based on the points set forth below.

The present invention is directed to interference control within a radio cell employing a HARQ protocol with synchronous retransmissions and power domain scheduling by the Node B. in prior art systems, when utilizing synchronous data packets in combination with a HARQ protocol, the scheduling Node B typically has no control on the transmission timing of retransmissions from the mobile terminals.

To solve this problem, the present independent claims provide that the feedback message indicates to the mobile terminal to transmit a retransmission data packet (for an unsuccessfully decoded data packet) after a predetermined time span upon receiving the feedback message. This allows control of

the interference caused by retransmissions by providing some control of the retransmission timing. To further improve interference control, the independent claims provide for scheduling the data transmissions by the transmission of a common control message so as to allow the scheduling Node Bs to control scheduled transmissions of data packets, i.e., the initial transmissions of the data packets by a group of mobile terminals within a radio cell.

Thus, in combination, the control of the retransmission timing as well as the utilization of a common control message to limit the maximum amount of resources a group of mobile terminals is allowed to utilize in the uplink for data transmission of initial data packets provides the scheduling Node B with a mechanism for controlling interference even though synchronous retransmissions (that are not scheduled) are utilized in the communication system.

Hwang et al. disclose a method for controlling data transmission in a radio communication system. More particularly, Hwang et al disclose a method for controlling the data transmission using response signals from a receiver including information that reflects received signal quality as well as whether an error has occurred in the data transmission (see paragraph [0002]).

In referring to a UMTS system in the background of the art section starting at paragraph [0003], Hwang et al. describe a conventional HARQ system with soft combining in paragraphs [0018] and [0034] in connection with Fig. 2. Based on the observation that such conventional HARQ systems (that only include a single bit for communicating the feedback (ACK/NACK)) may not indicate the quality of the received signal, the prior art reference suggests to include in the response signals control information that reflects received signal quality as well as an indication of whether or not the data transmission has been successfully accomplished (see for example paragraphs [0040], [0046] and [0068]).

In the event that a data packet has not been decoded successfully at the receiving side (see Fig. 4), the receiving side also determines the reception quality (for example the signal to interference ratio) and decides whether the determined reception quality exceeds a threshold value. If not, the receiving side communicates a NACK signal back to the transmitting side which includes in addition control information (such as the time delay, the transmission power or a multi-code number). If the packet data to be re-transmitted from the transmitting side are to be transmitted after a certain amount of time, the additional control information included in the NACK

signal comprises a command for delaying the time for a certain period and is forwarded to the transmitting side (see paragraph [0074]). As further explained in paragraph [0075], a 4-bit binary number may be utilized to provide different control information commands to the transmitting side.

The Applicants submit that Hwang et al. do not disclose the subject matter of independent claims 24, 28 and 40, given that the reference fails to disclose the features of scheduling data transmissions of a plurality of mobile stations, among which is the mobile station to which the feedback message is transmitted, as well as the transmission of a common control message to a plurality of mobile stations that is restricting the transmission format combination subset of each of the plurality of mobile stations to determine a maximum resource common to the plurality of mobile stations.

Furthermore, Hwang et al. do not relate to a synchronous HARQ protocol (see the preamble of the present independent claims) within the context of the present application. It is noted that the term "synchronous retransmissions" refers to retransmissions being autonomously transmitted by the mobile station (without scheduling) after a predetermined amount of time upon having received the feedback message (NACK). See application page 12, second paragraph.

Concerning the subject matter of independent claims 32 to 39, the Applicants submit that the feature of restricting the transmission format combination subset of the mobile terminal to determine a maximum resource according to a common control message is not anticipated in any text passage of Hwang et al. Although the Office Action points to paragraph [0075] of Hwang et al. for allegedly disclosing this feature, the Applicants cannot recognize which teaching in this paragraph would disclose the feature in question. If this rejection is reasserted in a subsequent office action, the Applicants respectfully request clarification of this point.

In view of the above, the Applicants respectfully submit that the subject matter of claims 30-39 is novel over Hwang et al.

With respect to the combination of Hwang et al., and Padovani et al., the Applicants submit that claims 24-31 and 40 are not rendered obvious by the individual or combined teachings of these references for the following reasons.

As becomes immediately apparent from the summary of the invention section of Padovani, the document is not related to the operation of a HARQ system in connection with scheduling related issues. The passage in column 10, lines 15-54 referred to in the Office Action only provides a general teaching that a channel

scheduler 48 may be provided per base station or for a group of base stations that is scheduling of high data rate transmission, such that the system goals of maximum data throughput and minimum transmission delay are optimized.

However, there is no teaching provided by Padovani that would indicate the interaction of this scheduling function with the feedback signaling of an HARQ protocol. Nor is there any teaching provided by Padovani with respect to restricting the transmission format combination subset of each of a plurality of transmitting entities by employing a common control message, as mentioned throughout the present independent claims. To the contrary, the channel scheduler 48 proposed in Padovani et al., will individually schedule the transmissions of the individual terminals depending on their respective channel quality.

Padovani in no way teaches or suggests that this scheduler would restrict transmission format combination subset of each of the plurality of transmitting entities to achieve a common maximum resource.

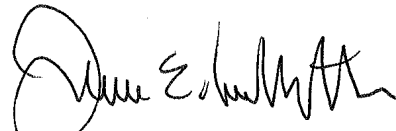
Accordingly, for at least the above reasons, the Applicants respectfully submit that each of the present independent claims, and each of the claims dependent therefrom, is novel over Hwang et al., and is non-obvious over the combined teachings of Hwang et al. and Padovani et al.

Therefore, allowance of all of the presently pending claims is considered to be warranted.

In view of the above, it is submitted that this application is in condition for allowance, and a notice to that effect is respectfully solicited.

If any issues remain which may best be resolved through a telephone communication, the Examiner is requested to telephone the undersigned at the local Washington, D.C. telephone number listed below.

Respectfully submitted,



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